MA-35M(85)-1

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# Air-Conditioning and Refrigeration Equipment, Including Warm Air Furnaces

1985

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U.S. Department of Commerce
BUREAU OF THE CENSUS

## SUMMARY OF FINDINGS

In 1985, categories of air-conditioning and refrigeration equipment showed several changes. Sales of heat transfer equipment increased 7 percent from $3,545 million in 1984 to $3,818 million. Unitary air-conditioners showed a 2-percent increase in shipments from $2,914 million to $2,985 million.

There was a 9-percent decrease in sales of compressors and compressor units. The value of units sold decreased from $2,225 million in 1984 to $2,035 million in 1985. Shipments of condensing units decreased 11 percent from $249 million to $224 million. Room air-conditioners and dehumidifiers showed a 28-percent decrease in sales from $943 million to $735 million. Sales of warm air furnaces and humidifiers increased 4 percent from $686 million to $716 million.

A description of the survey methodology and other related information appears on page 8.

Table 1. QUANTITY AND VALUE OF SHIPMENTS OF CONDENSING UNITS: 1985 AND 1984

(Quantity in number of units; value in thousands of dollars)

| Product code | Product description | Number of companies | 1985 | | 1984 | |
|---|---|---|---|---|---|---|
| | | | Quantity | Value | Quantity | Value |
| 35855 00 | Condensing units, refrigeration | (X) | 414,126 | 223,675 | 440,388 | r248,507 |
| | Air-cooled | (X) | 396,535 | 162,403 | 423,499 | 165,123 |
| 35855 10 | Open-type, under 15 hp | 4 | 1,556 | 1,471 | 1,934 | 2,296 |
| | Hermetic-type | (X) | 394,979 | 160,932 | 421,565 | 162,827 |
| 35855 01 | 1/8 hp and under | 3 | | | | |
| 35855 02 | 1/6 hp | 2 | | | | |
| 35855 03 | 1/5 hp | 2 | | | | |
| 35855 27 | 1/4 hp | 4 | | | | |
| 35855 28 | 1/3 hp | 6 | 320,671 | 58,121 | 344,789 | 59,101 |
| 35855 29 | 1/2 hp | 13 | | | | |
| 35855 30 | 3/4 hp | 15 | | | | |
| 35855 31 | 1 hp | 18 | | | | |
| 35855 32 | 1-1/2hp | 18 | 19,631 | 12,564 | 20,518 | 12,938 |
| 35855 33 | 2 hp | 19 | 20,846 | 15,980 | 21,228 | 16,461 |
| 35855 34 | 2-1/2 hp | 2 | 13,198 | 17,873 | 13,430 | 18,356 |
| 35855 35 | 3 hp | 18 | | | | |
| 35855 38 | Over 3 hp but under 15 hp | 18 | 20,633 | 56,394 | 21,600 | 55,971 |
| | Water-cooled | (X) | 11,856 | 13,051 | 11,700 | 9,132 |
| 35855 46 | Open-type, 10 hp and under | 5 | 168 | 262 | 171 | 291 |
| | Hermetic-type | (X) | 11,688 | 9,039 | 11,529 | 8,841 |
| 35855 48 | 1-1/2 hp and under | 9 | 8,338 | 3,750 | 8,100 | 3,638 |
| 35855 53 | 2 hp | 8 | 1,314 | 1,154 | 1,249 | 1,180 |
| 35855 54 | 3 hp | 8 | 893 | 985 | 983 | 1,172 |
| 35855 55 | 4 hp | 2 | 667 | 1,364 | 663 | 1,263 |
| 35855 56 | 5 hp | 8 | | | | |
| 35855 57 | 7-1/2 hp | 7 | 206 | 636 | 246 | 691 |
| 35855 59 | 10 hp | 6 | 270 | 1,150 | 288 | 897 |
| | Water or air-cooled (open- and hermetic-type) | (X) | 5,735 | 48,221 | 5,189 | 44,252 |
| 35855 61 | 15 hp | 16 | 1,910 | 15,708 | 2,405 | 16,398 |
| 35855 62 | 20 hp | 17 | 1,954 | 13,605 | 1,124 | 8,912 |
| 35855 63 | 25 hp | 15 | 571 | 4,112 | 591 | 4,573 |
| 35855 64 | 30 hp | 15 | 705 | 5,869 | 529 | 5,218 |
| 35855 70 | 40 hp and over | 16 | 595 | 8,927 | r540 | 9,151 |
| 35855 71 | Number of open-type units | 17 | 1,336 | (X) | r997 | (X) |
| 35855 72 | Number of hermetic-type units | 10 | 4,415 | (X) | 4,192 | (X) |

rRevised by 5 percent or more from previously published figures. (X) Not applicable.

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Table 2. QUANTITY AND VALUE OF SHIPMENTS OF COMPRESSORS AND COMPRESSOR UNITS: 1985 AND 1984

(Quantity in number of units; value in thousands of dollars)

| Product code | Product description | Number of companies | 1985 | | 1984 | |
|---|---|---|---|---|---|---|
| | | | Quantity | Value | Quantity | Value |
| 35854 00 | Compressors and compressor units[1 2] | (X) | 19,855,166 | 2,034,543 | 22,776,102 | 2,225,414 |
| | Refrigerants, except ammonia | (X) | 19,854,110 | 2,007,686 | 22,774,869 | 2,201,254 |
| | 10 hp. and under | (X) | 9,405,432 | 987,816 | 12,500,265 | 1,170,561 |
| | Hermetic-type motor compressors: | | | | | |
| 35854 11 | Under 3 hp | 12 | 7,140,646 | 536,191 | 10,019,029 | 679,622 |
| 35854 36 | 3 to 10 hp | 18 | 2,255,567 | 447,846 | 2,468,970 | 486,487 |
| | Open-type compressors (with/without motors): | | | | | |
| 35854 74 | 3 hp. and under | 6 | 9,219 | 3,779 | 12,266 | 4,452 |
| 35854 75 | 4 to 10 hp | 9 | | | | |
| | Over 10 hp. (open- and hermetic-types) | (X) | 100,140 | 152,955 | 104,815 | 150,686 |
| 35854 46 | 15 hp | 16 | 30,662 | 24,216 | 31,857 | 25,016 |
| 35854 47 | 20 hp | 12 | 22,041 | 22,513 | 21,990 | 23,399 |
| 35854 48 | 25 hp | 15 | 17,433 | 15,813 | 14,458 | 17,896 |
| 35854 49 | 30 hp | 15 | 15,518 | 19,261 | 15,967 | 19,692 |
| 35854 51 | 40 hp | 13 | 10,426 | 19,253 | 11,222 | 18,943 |
| 35854 52 | 50 hp | 12 | 1,974 | 5,781 | 2,367 | 7,145 |
| 35854 53 | 60 hp | 12 | 1,911 | 7,255 | 1,751 | 6,880 |
| 35854 54 | 75 hp | 10 | 2,255 | 9,180 | 2,548 | 10,131 |
| 35854 55 | 100 hp | 9 | 1,414 | 6,314 | 1,096 | 5,124 |
| 35854 56 | Over 100 hp | 8 | 1,506 | 23,369 | 1,559 | 16,460 |
| 35854 57 | Number of open-type units | 19 | 99,750 | (X) | 104,703 | (X) |
| 35854 58 | Number of hermetic-type units | 9 | | | | |
| 38554 59 | Automotive air-conditioning compressors (open-type, with or without motor) | 8 | 10,348,538 | 866,915 | 10,169,789 | 880,007 |
| 35854 81 | Screw type | 6 | | | | |
| | Ammonia refrigerants | (X) | 1,056 | 26,857 | 1,233 | 24,160 |
| 35854 86 | Under 75 hp | 7 | 249 | 2,967 | 267 | 2,766 |
| 35854 68 | 75 hp | 6 | 84 | 1,222 | 103 | 1,400 |
| 35854 69 | 100 hp | 6 | 395 | 9,097 | 516 | 9,560 |
| 35854 71 | 101 to 200 hp | 7 | | | | |
| 35854 72 | 201 hp. and over | 5 | 328 | 13,571 | 347 | 10,434 |

(X) Not applicable.

[1] Represents only those compressors and compressor units produced and shipped separately.
[2] Includes units shipped for household refrigerators.

Table 3. QUANTITY OF ASSEMBLED COMPRESSOR BODIES: 1985 AND 1984

(Quantity in number of units)

| Product code | Product description | Number of companies | 1985 | 1984 |
|---|---|---|---|---|
| | Compressor bodies[1 2] | (X) | 19,760,058 | 22,934,824 |
| | Refrigerants, except ammonia | (X) | 19,759,206 | 22,933,952 |
| | Other than automotive air conditioning: | | | |
| 99010 00 | 1/5 hp. and under | 3 | 359,075 | 829,792 |
| 99020 00 | 1/4 hp | 6 | 1,916,816 | 3,311,563 |
| 99030 00 | 1/3 hp | 5 | 617,920 | 756,755 |
| 99040 00 | 1/2 hp | 5 | 394,371 | 575,985 |
| 99050 00 | 3/4 hp | 6 | 891,187 | 892,268 |
| 99060 00 | 1 hp | 8 | 1,142,143 | 1,487,706 |
| 99070 00 | 1-1/2 hp | 6 | 602,896 | 803,281 |
| 99080 00 | 2 hp | 9 | 2,010,635 | 2,190,570 |
| 99090 00 | 3 hp | 10 | 1,657,340 | 1,905,021 |
| 99110 00 | 4 hp | 8 | 583,245 | 611,039 |
| 99120 00 | 5 hp | 12 | 522,058 | 548,233 |
| 99130 00 | 7-1/2 hp | 12 | 150,447 | 166,836 |
| 99140 00 | 10 hp | 13 | 94,313 | 100,613 |
| 99150 00 | 15 hp | 11 | 50,595 | 52,241 |
| 99160 00 | 20 hp | 9 | 30,141 | 30,892 |
| 99170 00 | 25 hp | 9 | 14,400 | 16,024 |
| 99410 00 | 30 hp | 10 | 26,796 | 25,072 |
| 99420 00 | 40 hp | 10 | 12,519 | 15,139 |
| 99430 00 | 50 hp | 9 | 3,267 | 3,895 |
| 99440 00 | 60 hp | 10 | 2,863 | 2,865 |
| 99450 00 | 75 hp | 9 | 3,326 | 3,190 |
| 99460 00 | 100 hp. and over | 9 | 3,572 | 2,781 |
| 99470 00 | Automotive air conditioning, (including passenger automobiles, trucks, buses, agriculture, and construction machinery) | 23 | 8,669,281 | 8,602,191 |
| 99600 00 | Ammonia refrigerants | 5 | 852 | 872 |

(X) Not applicable.

[1] Includes units for household refrigerators.
[2] Represents the total number of compressor bodies assembled, whether shipped separately or incorporated into a condensing package or unitary end-use product, such as single package air conditioners, freezers, and refrigerators.

Table 4. QUANTITY AND VALUE OF SHIPMENTS OF HEAT TRANSFER EQUIPMENT: 1985 AND 1984

(Quantity in number of units; value in thousands of dollars)

| Product code | Product description | Number of companies | 1985 | | 1984 | |
|---|---|---|---|---|---|---|
| | | | Quantity | Value | Quantity | Value |
| 35851 00 | Heat transfer equipment, except room and unitary air conditioners | (X) | (X) | 3,813,590 | (X) | 3,544,964 |
| | Heat transfer equipment, except other air-conditioning and refrigeration equipment | (X) | 736,259 | 792,416 | 742,346 | 687,672 |
| | Evaporative condensers | (X) | 2,508 | 29,307 | 2,426 | 29,531 |
| 35851 04 | 100 tons and under | 10 | 1,211 | 7,417 | 1,042 | 6,009 |
| 35851 07 | Over 100 tons | 9 | 1,297 | 21,890 | 1,384 | 23,522 |
| | Room fan-coil air-conditioning units | (X) | 197,877 | 75,329 | 209,001 | 72,925 |
| 35851 08 | Vertical stack | 3 | 17,142 | 9,618 | 18,976 | 10,296 |
| 35851 09 | Vertical | 7 | 90,603 | 38,912 | 98,041 | 38,679 |
| 35851 10 | Horizontal | 10 | 90,132 | 26,799 | 91,984 | 23,950 |
| 35851 11 | Room air induction units | 2 | (D) | (D) | (D) | (D) |
| | Central station air-conditioning units (motor-driven fan-type) | (X) | 56,627 | 276,979 | 53,413 | 199,115 |
| 35851 13 | Draw through | 24 | 43,504 | 235,102 | 39,965 | 150,825 |
| 35851 15 | Blow through | 13 | 6,707 | 21,926 | 7,106 | 29,613 |
| 35851 17 | Heating and ventilating | 13 | 6,416 | 19,951 | 6,342 | 18,677 |
| 35851 01 | Packaged terminal air conditioners[1] | 10 | 172,256 | 246,424 | 184,780 | 232,540 |
| 35851 03 | Packaged terminal heat pumps | 6 | 81,964 | 43,772 | 93,549 | 49,816 |
| | Unit coolers (refrigeration) | (X) | (D) | (D) | (D) | (D) |
| | Ceiling and wall-mounted types | (X) | 203,956 | 77,265 | 179,726 | 66,585 |
| 35851 18 | 1,000 Btu/hr | 7 | 23,028 | 1,739 | 21,256 | 1,640 |
| 35851 19 | 1,001 to 2,000 Btu/hr | 8 | 33,557 | 3,604 | 32,970 | 3,585 |
| 35851 20 | 2,001 to 4,000 Btu/hr | 10 | 18,280 | 2,888 | 15,268 | 2,350 |
| 35851 21 | 4,001 to 6,000 Btu/hr | 12 | 15,284 | 3,690 | 14,182 | 3,561 |
| 35851 22 | 6,001 to 8,000 Btu/hr | 12 | 21,118 | 6,254 | 18,071 | 4,960 |
| 35851 23 | 8,001 to 12,000 Btu/hr | 12 | 38,579 | 12,345 | 30,800 | 9,722 |
| 35851 24 | 12,001 to 18,000 Btu/hr | 13 | 28,485 | 13,903 | 24,365 | 11,804 |
| 35851 25 | Over 18,000 Btu/hr | 16 | 25,625 | 32,842 | 23,060 | 28,963 |
| 35851 26 | Number of remote units | 7 | 147,297 | (X) | 122,289 | (X) |
| 35851 27 | Number of single package units | 10 | 56,659 | (X) | 57,683 | (X) |
| 35851 57 | Floor-mounted dry and spray types | 3 | (D) | (D) | (D) | (D) |
| | Air cooled refrigerant condensers (remote type) | (X) | 16,590 | 35,505 | 16,333 | 35,024 |
| 35851 29 | 30 tons and under | 16 | 12,510 | 14,213 | 11,980 | 13,187 |
| 35851 31 | 40 tons | 10 | 1,305 | 5,014 | 1,516 | 5,774 |
| 35851 33 | 50 tons and over | 12 | 2,775 | 16,278 | 2,837 | 16,063 |
| | Miscellaneous heat transfer equipment | (X) | (X) | 403,181 | (X) | 443,401 |
| | Shell-and-tube, shell-and-coil, shell-and-u-tube, tube-in-tube: | | | | | |
| 35851 35 | Condensers | 15 | (X) | 35,524 | (X) | 38,270 |
| 35851 36 | Liquid coolers | 15 | (X) | 22,188 | (X) | 32,921 |
| 35851 37 | Liquid-suction heat exchangers, and refrigerant liquid receivers | 11 | (X) | 35,934 | (X) | 37,012 |
| | Central system finned coils (air-conditioning and refrigeration type) used with but not including means for air circulation: | | | | | |
| 35851 38 | Standard steam and steam distributing tube | 17 | (X) | 16,949 | (X) | 16,264 |
| 35851 39 | Standard water cooling and/or heating and cleanable tube water | 25 | (X) | 47,455 | (X) | 48,165 |
| 35851 40 | Volatile refrigerant cooling | 15 | (X) | 12,767 | (X) | 10,359 |
| | Coil sales by original equipment manufacturers intended for resale or assembly into equipment by other manufacturers (all types) | (X) | (X) | 221,474 | (X) | 248,439 |
| 35851 81 | Copper (only)[2] | 6 | (X) | (2) | (X) | (2) |
| 35851 82 | Copper and aluminum | 17 | (X) | 143,520 | (X) | 173,626 |
| 35851 83 | Aluminum (only) | 5 | (X) | [2]77,954 | (X) | [2]74,813 |
| 35851 84 | All others (including steel) | 9 | | | | |
| 35851 67 | Factory-assembled, finned gravity coils including wetted-surface dehumidifiers | 7 | (X) | 10,890 | (X) | 11,971 |
| | Other air-conditioning and refrigeration equipment | (X) | 15,579,880 | 2,622,593 | 14,494,408 | 2,413,891 |
| | Centrifugal liquid chilling packages | (X) | (D) | (D) | (D) | (D) |
| | Hermetic type | (X) | (D) | (D) | (D) | (D) |
| 35851 46 | 200 hp. and under | 4 | 713 | 24,526 | 489 | 19,514 |
| 35851 49 | 201 to 300 hp | 6 | 752 | 39,347 | 638 | 29,737 |
| 35851 50 | 301 to 400 hp | 5 | 809 | 43,433 | 754 | 40,589 |
| 35851 51 | 401 to 500 hp | 3 | (D) | (D) | (D) | (D) |
| 35851 52 | 501 to 1,000 hp | 5 | 508 | 45,761 | 408 | r38,749 |
| 35851 53 | Over 1,000 hp | 3 | (D) | (D) | (D) | (D) |
| 35851 55 | Open-type (all sizes) | 3 | (D) | (D) | (D) | (D) |
| 35851 75 | Absorption liquid-chilling systems | 3 | 131 | 9,824 | 153 | 12,521 |
| 35851 76 | Absorption and open-type absorption systems | 4 | 1,074 | 24,304 | 1,087 | 20,834 |
| | Mobile vehicle refrigeration systems: | | | | | |
| 35851 77 | Mechanical refrigeration systems for railway freight cars | - | 44,916 | 228,386 | r36,548 | 259,413 |
| 35851 78 | Mechanical refrigeration systems for other mobile vehicles (including trucks, trailers, vans, etc.) | 12 | | | | |
| | Mobile vehicle mechanical air-conditioning systems: | | | | | |
| 35851 79 | For passenger automobiles[3] | 13 | 13,008,516 | 1,293,389 | 12,196,385 | 1,210,279 |
| 35851 80 | For truck agriculture and construction machinery cabs (excluding mobile home, bus, and truck van systems) | 14 | 2,154,467 | 181,185 | 1,948,655 | 177,923 |

See footnotes at end of table.

Table 4. QUANTITY AND VALUE OF SHIPMENTS OF HEAT TRANSFER EQUIPMENT: 1985 AND 1984—Continued

(Quantity in number of units; value in thousands of dollars)

| Product code | Product description | Number of companies | 1985 | | 1984 | |
|---|---|---|---|---|---|---|
| | | | Quantity | Value | Quantity | Value |
| | Other air-conditioning and refrigeration equipment--Continued | | | | | |
| | Ice-making machines | (X) | 281,956 | 252,009 | 218,281 | 235,952 |
| | Self-contained ice-cube makers | (X) | 167,884 | 168,904 | 181,197 | 163,046 |
| 35851 62 | Automatic, under 200 lbs. per day | 10 | 80,677 | 43,630 | 97,660 | 36,674 |
| 35851 64 | Automatic, 201 lbs. to 300 lbs. per day | 5 | 28,888 | 25,992 | 26,703 | 23,992 |
| 35851 66 | Automatic, 301 lbs. and over per day | 10 | 58,319 | 99,282 | 56,834 | 102,380 |
| | Self-contained flake or chip machines | (X) | 18,979 | 52,358 | 22,978 | 43,873 |
| 35851 72 | 300 lbs. and under per day | 7 | 4,876 | 13,674 | 5,713 | 15,726 |
| 35851 74 | 301 lbs. and over per day | 10 | 14,103 | 38,684 | 17,265 | 28,147 |
| 35851 73 | Not self-contained | 6 | 392 | 6,208 | 447 | 5,008 |
| 35851 71 | Combination ice makers and ice dispensers | 7 | 12,718 | 22,106 | 11,958 | 20,752 |
| 35851 70 | Combination ice makers and drink dispensers | 5 | 1,306 | 2,433 | 1,701 | 3,273 |
| | Reciprocating liquid chillers | (X) | 13,734 | 179,194 | 13,788 | 166,704 |
| 35851 87 | 20 hp. and under | 18 | 6,400 | 35,145 | 6,751 | 34,531 |
| 35851 88 | 21 to 49 hp | 12 | 2,035 | 21,022 | 2,239 | 24,162 |
| 35851 89 | 50 to 75 hp | 10 | 2,385 | 38,313 | 2,049 | 32,653 |
| 35851 90 | Over 75 hp | 12 | 2,914 | 84,714 | 2,749 | 75,358 |
| 35851 97 | Number of water-chilling units | 22 | 13,318 | (X) | r13,278 | (X) |
| 35851 98 | Number of other-chilling units | 5 | 472 | (X) | r725 | (X) |
| 35851 99 | Number of open-type units | 5 | 80 | (X) | 129 | (X) |
| 35851 00 | Number of hermetic-type units | 19 | 13,009 | (X) | 13,874 | (X) |
| 35851 96 | Factory-fabricated water-cooling towers | 9 | 10,787 | 101,490 | 10,853 | 94,666 |
| 35853 43 | Commercial refrigeration equipment, mechanical drinking water coolers | 7 | 564,884 | 130,918 | 528,043 | 123,558 |

- Represents zero. (D) Data withheld to avoid disclosing the operations of individual companies. rRevised by 5 percent or more from previously published figures. (X) Not applicable.

[1]Defined as factory selected combinations of heating and cooling components or assemblies intended to serve an individual room and comprising: (1) heating assembly available with element for use with hot water, steam, and electricity; means for forced heated air circulation and distribution; integral or remote temperature controls; (2) slide-in cooling section with complete refrigerant cycle; (3) room cabinet; (4) provision for outdoor air intake and discharge and accessories as required for mounting in a building wall; (5) provisions for air filtration and ventilation; (6) permanent individual branch circuit wiring with a suitable line cord or terminating at a junction box within the room cabinet; and (7) provision for free conditioned air distribution, or when forced circulation is employed for minimal duct work having a total external static resistance not exceeding 1/10 inch of water.

[2]"Copper (only) coil sales by original equipment manufacturers intended for resale or assembly into equipment by other manufacturers (all types)", product code 35851 81, is included with aluminum "only coil sales, product code 35851 83, and all others" including steel", product code 35851 84 to avoid disclosing operations of individual companies.

[3]Both quantity and value figures exclude systems assembled from purchased components and installed at passenger automobile assembly lines. In addition, for the system shown, the values are understated because of the exclusion of compressors for some systems.

Table 5. QUANTITY AND VALUE OF SHIPMENTS OF ROOM AIR CONDITIONERS AND DEHUMIDIFIERS: 1985 AND 1984

(Quantity in number of units; value in thousands of dollars)

| Product code | Product description | Number of companies | 1985 | | 1984 | |
|---|---|---|---|---|---|---|
| | | | Quantity | Value | Quantity | Value |
| 35856 00 | Room air conditioners and dehumidifiers | (X) | 3,256,086 | 734,965 | r3,625,494 | 942,933 |
| | Room air conditioners | (X) | 2,666,950 | 639,198 | 3,039,491 | 846,916 |
| 35856 31 | 5,999 Btu/hr. and under | 9 | 666,975 | 98,586 | 821,176 | 141,625 |
| | 6,000 to 6,999 Btu/hr.: | | | | | |
| 35856 33 | 7-1/2 amp. 115 volts | 9 | 173,822 | 22,100 | 145,730 | 32,842 |
| 35856 35 | All other | 3 | | | | |
| | 7,000 to 7,999 Btu/hr.: | | | | | |
| 35856 37 | 7-1/2 amp. 115 volts | 10 | 172,404 | 32,413 | 180,910 | 42,469 |
| 35856 39 | All other | 6 | 58,862 | 14,048 | 59,562 | 13,586 |
| | 8,000 to 8,999 Btu/hr.: | | | | | |
| 35856 41 | 115 volts | 9 | 236,117 | 53,478 | 207,322 | 51,326 |
| 35856 43 | 208 to 230 volts | 6 | 26,029 | 5,403 | 20,384 | 5,440 |
| | 9,000 to 9,999 Btu/hr.: | | | | | |
| 35856 45 | 115 volts | 11 | 88,264 | 26,643 | 78,538 | 23,372 |
| 35856 47 | 208 to 230 volts | 9 | 72,277 | 21,111 | 95,397 | 26,222 |
| | 10,000 to 10,999 Btu/hr.: | | | | | |
| 35856 51 | 115 volts | 10 | 176,095 | 40,092 | 177,799 | 50,342 |
| 35856 53 | 208 to 230 volts | 7 | 31,818 | 6,745 | 35,887 | 10,638 |
| | 11,000 to 12,999 Btu/hr.: | | | | | |
| 35856 55 | 115 volts | 8 | 150,802 | 52,322 | 230,515 | 67,805 |
| 35856 57 | 208 to 230 volts | 11 | 138,048 | 38,129 | 149,084 | 47,864 |
| 35856 61 | 13,000 to 14,999 Btu/hr | 10 | 100,462 | 31,673 | 154,694 | 53,984 |
| 35856 63 | 15,000 to 16,999 Btu/hr | 12 | 49,435 | 15,025 | 61,191 | 22,326 |
| 35856 65 | 17,000 to 19,999 Btu/hr | 10 | 303,449 | 91,041 | 341,520 | 124,990 |
| 35856 67 | 20,000 to 22,999 Btu/hr | 10 | 84,868 | 27,797 | 123,692 | 49,799 |
| 35856 68 | 23,000 to 25,999 Btu/hr | 10 | 90,480 | 33,982 | 102,528 | 45,816 |
| 35856 69 | 26,000 Btu/hr. and over | 11 | 46,743 | 28,610 | 53,562 | 36,470 |
| 35856 11 | Electrically operated dehumidifiers, mechanically refrigerated, self-contained | 13 | 589,136 | 95,767 | r586,003 | r96,017 |

rRevised by 5 percent or more from previously published figures. (X) Not applicable.

Table 6. QUANTITY AND VALUE OF SHIPMENTS OF UNITARY AIR CONDITIONERS: 1985 AND 1984

(Quantity in number of units; value in thousands of dollars)

| Product code | Product description | Number of companies | 1985 | | 1984 | |
|---|---|---|---|---|---|---|
| | | | Quantity | Value | Quantity | Value |
| 35852 00 | Unitary air conditioners | (X) | (X) | 2,985,151 | (X) | 2,913,530 |
| | Air conditioners (except window and wall types) | (X) | 366,029 | 393,598 | 365,339 | 393,298 |
| 35852 30 | Recreational vehicle air conditioners | 6 | 172,841 | 64,653 | 173,914 | 74,242 |
| | Single package, with or without evaporator fans (including refrigeration chassis and remote condenser type): | | | | | |
| | Horizontal | (X) | 174,654 | 259,854 | 174,993 | 258,146 |
| 35852 32 | Under 27,000 Btu/hr | 24 | 31,147 | 17,964 | r28,431 | r16,928 |
| 35852 33 | 27,000 to 32,999 Btu/hr | 20 | 18,335 | 12,009 | 20,822 | 14,210 |
| 35852 35 | 33,000 to 53,999 Btu/hr | 26 | 74,013 | 57,212 | 75,040 | 58,705 |
| 35852 37 | 54,000 to 64,999 Btu/hr | 20 | 26,936 | 30,025 | 26,042 | 28,706 |
| 35852 39 | 65,000 to 96,999 Btu/hr | 13 | 7,320 | 17,237 | 8,139 | 18,591 |
| 35852 41 | 97,000 to 134,999 Btu/hr | 14 | 6,770 | 20,834 | 6,679 | 19,944 |
| 35852 43 | 135,000 to 184,999 Btu/hr | 10 | 3,872 | 17,632 | 3,817 | 17,232 |
| 35852 45 | 185,000 to 249,999 Btu/hr | 10 | 1,810 | 15,852 | 1,661 | 13,471 |
| 35852 47 | 250,000 to 319,999 Btu/hr | 8 | 926 | 9,005 | 944 | 9,202 |
| 35852 49 | 320,000 to 379,999 Btu/hr | 8 | 891 | 9,723 | 912 | 9,988 |
| 35852 51 | 380,000 Btu/hr. and over | 9 | 2,634 | 52,361 | 2,506 | 51,169 |
| | Other than horizontal | (X) | 18,534 | 69,091 | 16,432 | 60,910 |
| 35852 34 | Under 33,000 Btu/hr | 7 | 1,220 | 1,755 | 529 | 516 |
| 35852 36 | 33,000 to 53,999 Btu/hr | 11 | 4,091 | 6,105 | 2,923 | 4,247 |
| 35852 38 | 54,000 to 64,999 Btu/hr | 8 | 4,055 | 8,102 | 3,283 | 6,112 |
| 35852 40 | 65,000 to 96,999 Btu/hr | 10 | 2,101 | 5,614 | 2,244 | 5,575 |
| 35852 42 | 97,000 to 134,999 Btu/hr | 9 | 2,452 | 8,522 | 2,370 | 7,899 |
| 35852 44 | 135,000 to 184,999 Btu/hr | 8 | 1,785 | 8,136 | 1,665 | 7,355 |
| 35852 46 | 185,000 to 249,999 Btu/hr | 6 | a786 | 5,301 | a1,020 | 5,292 |
| 35852 48 | 250,000 Btu/hr. and over | 6 | 2,044 | 25,556 | a2,398 | a23,914 |
| | For horizontal units: | | | | | |
| 35852 53 | Air or evaporative-cooled units | 35 | 174,654 | (X) | r174,993 | (X) |
| 35852 54 | Water-cooled units | 5 | | | | |
| | For other than horizontal units: | | | | | |
| 35852 55 | Air or evaporative-cooled units | 12 | 15,511 | (X) | r13,130 | (X) |
| 35852 56 | Water-cooled units | 10 | 8,600 | (X) | 8,573 | (X) |
| | Year-round air conditioners, single package and remote-condenser type (except heat pumps) | (X) | 283,785 | 586,217 | 255,537 | r406,080 |
| 35852 21 | Under 33,000 Btu/hr | 19 | 77,613 | 65,780 | r61,363 | r57,864 |
| 35852 22 | 33,000 to 38,999 Btu/hr | 19 | 50,786 | 49,375 | 55,441 | 42,823 |
| 35852 23 | 39,000 to 43,999 Btu/hr | 12 | 16,552 | 16,975 | 15,505 | 15,557 |
| 35852 25 | 44,000 to 53,999 Btu/hr | 17 | 23,399 | 29,498 | 20,576 | 26,188 |
| 35852 26 | 54,000 to 64,999 Btu/hr | 18 | 54,096 | 86,757 | 47,870 | 80,442 |
| 35852 27 | 65,000 to 134,999 Btu/hr | 14 | 41,417 | 142,703 | 35,209 | 131,101 |
| 35852 29 | 135,000 to 184,999 Btu/hr | 13 | 10,907 | 58,772 | 9,855 | 51,469 |
| 35852 91 | 185,000 to 249,999 Btu/hr | 11 | 3,342 | 29,713 | a4,636 | a r42,625 |
| 35852 92 | 250,000 to 319,999 Btu/hr | 10 | 2,342 | 26,806 | 1,930 | 19,637 |
| 35852 93 | 320,000 to 379,999 Btu/hr | 11 | 1,172 | 17,439 | 804 | 10,284 |
| 35852 94 | 380,000 to 539,999 Btu/hr | 7 | 814 | 15,313 | 684 | r12,417 |
| 35852 98 | 540,000 to 639,999 Btu hr | 6 | 411 | 11,950 | 739 | 9,451 |
| 35852 99 | 640,000 Btu/hr. and over | 6 | 934 | 35,046 | 925 | r24,222 |
| | Air source heat pumps (except room air conditioners) | (X) | 879,485 | 629,826 | 803,669 | 615,275 |
| | Single package: | | | | | |
| 35852 61 | Under 27,000 Btu/hr | 18 | 64,850 | 41,664 | r60,827 | 37,213 |
| 35852 62 | 27,000 to 41,999 Btu/hr | 19 | 78,041 | 64,172 | r72,622 | 64,144 |
| 35852 63 | 42,000 to 64,999 Btu/hr | 15 | 49,052 | 55,954 | r41,743 | 52,549 |
| 35852 64 | 65,000 Btu/hr. and over | 7 | 9,390 | 36,240 | 9,672 | 36,506 |
| | Split system heat pumps: | | | | | |
| 35852 67 | Under 27,000 Btu/hr | 16 | 296,609 | 135,427 | r256,152 | 126,209 |
| 35852 68 | 27,000 to 41,999 Btu/hr | 18 | 274,089 | 181,253 | r269,604 | 185,171 |
| 35852 69 | 42,000 to 64,999 Btu/hr | 18 | 100,109 | 97,789 | 85,856 | 86,822 |
| 35852 70 | 65,000 Btu/hr. and over | 6 | 7,345 | 17,327 | 7,193 | 16,661 |
| 35852 60 | Water source heat pumps (except room air conditioners) | 12 | 65,821 | 58,028 | 86,165 | 78,569 |
| | Split system air-conditioning units | (X) | (X) | 1,317,482 | (X) | 1,420,308 |
| | Air-conditioning condensing units | (X) | 1,971,704 | 975,359 | r2,035,759 | 1,056,056 |
| 35852 71 | Under 22,000 Btu/hr | 18 | 332,170 | 94,916 | r352,951 | r127,982 |
| 35852 72 | 22,000 to 26,999 Btu/hr | 20 | 442,024 | 141,723 | r453,661 | 161,002 |
| 35852 73 | 27,000 to 32,999 Btu/hr | 22 | 345,835 | 141,332 | 379,254 | 160,569 |
| 35852 74 | 33,000 to 38,999 Btu/hr | 22 | 382,850 | 193,665 | 393,637 | 202,691 |
| 35852 75 | 39,000 to 43,999 Btu/hr | 20 | 138,421 | 81,510 | 135,633 | 81,549 |
| 35852 76 | 44,000 to 53,999 Btu/hr | 20 | 158,527 | 109,400 | 152,945 | 107,585 |
| 35852 78 | 54,000 to 64,999 Btu/hr | 22 | 130,882 | 108,668 | 127,994 | 108,485 |
| 35852 79 | 65,000 to 96,999 Btu/hr | 15 | 17,756 | 24,504 | 15,070 | 22,001 |
| 35852 80 | 97,000 to 134,999 Btu/hr | 13 | 10,104 | 19,308 | 10,542 | 20,488 |
| 35852 81 | 135,000 to 184,999 Btu/hr | 11 | 6,722 | 19,404 | 7,088 | 19,664 |
| 35852 82 | 185,000 to 249,999 Btu/hr | 7 | 2,538 | 10,166 | 2,665 | 10,439 |
| 35852 83 | 250,000 to 319,999 Btu/hr | 7 | 1,011 | 4,873 | 1,270 | 6,053 |
| 35852 84 | 320,000 to 379,999 Btu/hr | 7 | 990 | 5,555 | 971 | 5,643 |
| 35852 87 | 380,000 to 539,999 Btu/hr | 7 | 696 | 5,303 | 858 | 6,647 |
| 35852 88 | 540,000 to 639,999 Btu/hr | 4 | 470 | 4,423 | 539 | 5,178 |
| 35852 89 | 640,000 Btu/hr. and over | 3 | 708 | 10,609 | 681 | 10,080 |
| | Air conditioning coils | (X) | 1,858,644 | 342,123 | 1,967,668 | 364,252 |
| 35852 85 | With blower | 26 | 802,654 | 213,613 | 957,254 | 226,263 |
| 35852 86 | Without blower | 19 | 1,055,990 | 128,510 | 1,010,414 | 137,989 |

Note: The percent of estimation of each item is indicated as follows (see "Description of Survey" for a discussion of estimation of missing reports): a25 to 50 percent of this item is estimated.

rRevised by 5 percent or more from previously published figures. (X) Not applicable.

Table 7. QUANTITY AND VALUE OF SHIPMENTS OF NONELECTRIC WARM AIR FURNACES AND HUMIDIFIERS: 1985 AND 1984

(Quantity in number of units; value in thousands of dollars)

| Product code | Product description | Number of companies | 1985 | | 1984 | |
|---|---|---|---|---|---|---|
| | | | Quantity | Value | Quantity | Value |
| 3585A — | Nonelectric warm air furnaces and humidifiers | (X) | (X) | 715,756 | (X) | r685,951 |
| | Nonelectric warm air furnaces | (X) | 1,960,763 | 683,642 | r1,881,883 | r648,850 |
| | Forced air: | | | | | |
| 3585A 03 | Solid fuel (coal, coke, and wood) | 15 | 4,987 | 4,994 | p7,721 | p7,496 |
| | Oil: | | | | | |
| 3585A 04 | 150,000 Btu bonnet output and under | 21 | 129,220 | 64,757 | r118,297 | r61,023 |
| 3585A 05 | 150,001 to 400,000 Btu bonnet output | 20 | 7,373 | 6,601 | r6,415 | r6,102 |
| 3585A 06 | Over 400,000 Btu bonnet output | 9 | 433 | 2,111 | r537 | 5,210 |
| | Gas: | | | | | |
| 3585A 07 | 150,000 Btu bonnet output and under | 32 | 1,790,705 | 573,267 | r1,730,803 | 543,328 |
| 3585A 08 | 150,001 to 400,000 Btu bonnet output | 25 | 23,980 | 13,974 | r13,504 | r8,488 |
| 3585A 09 | Over 400,000 Btu bonnet output | 10 | 1,297 | 17,378 | p1,502 | 16,466 |
| 3585A 25 | Gravity air flow (cast-iron and steel) | 6 | 2,768 | 560 | 3,104 | p717 |
| 3585A 71 | Humidifiers (attachments to warm air furnaces) all types including central systems and self-contained | 23 | 422,385 | 32,114 | 427,504 | 37,121 |

Note: The percent of estimation of each item is indicated as follows (see "Description of Survey" for a discussion of estimation of missing reports): p25 to 50 percent of this item is estimated.

rRevised by 5 percent or more from previously published figures. (X) Not applicable.

Table 8. COMPARISON OF VALUES OF SHIPMENTS OF AIR CONDITIONING AND REFRIGERATION EQUIPMENT, AS REPORTED IN THE MA35M, THE 1984 ANNUAL SURVEY OF MANUFACTURES, AND THE 1982 CENSUS OF MANUFACTURES

(Value in millions of dollars)

| Product code | Product description | 1984 | | | 1982 | |
|---|---|---|---|---|---|---|
| | | | Annual Survey of Manufactures | | | |
| | | MA35M | Value | Standard error of estimates[1] | MA35M | Census of Manufactures |
| 3585 | Refrigeration and heating equipment | (X) | 14,439.8 | (NA) | (X) | 11,035.6 |
| 35851 | Heat transfer equipment, (except electrically operated dehumidifers), mechanically refrigerated, self-contained | 3,544.9 | 3,552.5 | 2 | 2,821.8 | 2,908.0 |
| 35852 | Unitary air conditioners | 2,913.5 | 3,080.9 | 2 | 1,942.4 | 1,972.1 |
| 35853 | Commercial refrigerators and related equipment | (X) | 1,489.9 | 4 | (X) | 1,070.8 |
| 35853 43 | Mechanical drinking water coolers | 123.5 | (NA) | (NA) | 94.5 | 95.0 |
| | Commercial refrigerators and other related equipment | (X) | | | (X) | 975.8 |
| 35854 | Compressors and compressor units, all refrigerants | 2,225.4 | 2,257.4 | 1 | 1,711.8 | 1,734.7 |
| 35855 | Condensing units, all refrigerants | r240.5 | 223.5 | 4 | 185.8 | 196.9 |
| 35856 | Room air conditioners and dehumidifiers | 942.9 | 970.9 | 1 | 892.3 | 897.5 |
| 35859[2] | Other refrigeration equipment, including soda and beer dispensing equipment | (X) | 609.2 | 6 | (X) | 428.9 |
| 3585A[3] | Warm air furnaces, including duct, except electric (exclude floor and wall), and humidifiers | r685.9 | 710.0 | 2 | 414.4 | 426.3 |
| 3585A 10 | Warm air furnaces, including duct furnaces | r648.8 | (NA) | (NA) | 387.4 | 389.9 |
| 3585A 20 | Humidifiers, all types, including central systems and self-contained | 37.1 | | | 27.0 | 23.1 |
| 3585A 00 | Warm air furnaces and humidifiers n.e.k. | (X) | | | (X) | 13.3 |
| 3585B[2] | Parts, components and accessories for air conditioning and heat transfer equipment | | | | | 871.9 |
| 3585B 10 | Parts for heat transfer equipment, including parts for air conditioning condensing units | | | | | 371.8 |
| 3585B 20 | Parts for unitary air conditioners | | | | | 147.2 |
| 3585B 30 | Parts for commercial refrigeration and related equipment | | | | | 101.2 |
| 3585B 40 | Parts for compressors and compressor units | | | | | 72.9 |
| 3585B 50 | Parts for condensing units, excluding air conditioning condensing units | (X) | 1,285.6 | 4 | (X) | 4.7 |
| 3585B 60 | Parts for dehumidifiers and room air conditioners | | | | | 20.9 |
| 3585B 70 | Parts for other refrigeration and air conditioning equipment | | | | | 57.5 |
| 3585B 72 | Parts for warm air furnaces, including duct furnaces (excluding complete humidifiers | | | | | 27.7 |
| 3585B 00 | Parts and accessories for air conditioning and heat transfer equipment n.e.k. | | | | | 68.0 |
| 35850 00 | Refrigeration and heating equipment n.e.k., typically for establishments with 10 employees or more | (4) | 260.0 | 3 | (4) | 405.4 |
| 35850 02 | Refrigeration and heating equipment n.e.k., typically for establishments with less than 10 employees | | | | | 123.1 |

Note: In the 1982 Census of Manufactures, shipments data for establishments of small companies, typically those with fewer than 10 employees, were estimated from administrative records data rather than collected on census questionnaires. These shipments are included in product code 35850 02. Products not adequately identified by detail product were coded in some cases to the appropriate industry (four-digits) followed by "000."

(NA) Not available. n.e.k. Not specified by kind. rRevised by 5 percent or more from previously published figures. (X) Not applicable. CIR MA35M does not include all of product class 35853.

[1]The annual survey of manufactures percentage standard errors shown are the approximate relative errors of the estimates of level. A more detailed description of the standard error of estimate is given in the introduction of the annual survey of manufactures, Value of Product Shipments, MB4(AS)-2, under "Qualifications of the Data."

[2]In 1982, old SIC product class 35857 "Other refrigeration and air-conditioning equipment, including soda fountain and beer dispensing equipment" became new SIC product classes 35859, "Other refrigeration and air-conditioning equipment, including soda fountain and beer dispensing equipment" and 3585B "Parts, components and accessories for air-conditioning and heat transfer equipment."

[3]In 1982, old SIC product class 35858 "Warm air furnaces, except electric (except floor and wall) and parts and attachments" became new product class 3585A "Warm air furnaces, including duct, except electric (exclude floor and wall) and humidifiers" and 3585B "Parts, components, and accessories for air conditioning and heat transfer equipment."

[4]Available only from annual survey of manufactures and census of manufactures. Most of these data are derived from administrative records. See note above.

Table 9. SHIPMENTS, EXPORTS, IMPORTS, AND APPARENT CONSUMPTION OF AIR-CONDITIONING AND REFRIGERATION EQUIPMENT: 1985 AND 1984

(Quantity in thousand units; value in thousand dollars)

| Product code[1] | Product description | Manufacturers' shipments | | Exports of domestic merchandise[1] [2] | | | Percent exports to manufacturers' shipments | | Imports for consumption[4] | | Apparent consumption[6] | | Percent imports to apparent consumption | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Quantity | Value | Quantity | Value | Estimated producers' value[3] | Quantity | Value | Quantity | Value[5] | Quantity | Value | Quantity | Value |
| | 1985 | | | | | | | | | | | | | |
| 35851 | Heat transfer equipment, (excluding room and unitary air conditioners and dehumidifiers) | (X) | 3,813,590 | (NA) | (NA) | (NA) | (NA) | (NA) | | | | | | |
| 35852 | Unitary air conditioners | (NA) | 2,895,151 | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) |
| 35853 43 | Commercial refrigeration equipment, mechanical drinking water coolers | 565 | 130,918 | 77 | 12,234 | 10,043 | 14 | 9 | | | | | | |
| 35854 | Compressors and compressor units, all refrigerants | 19,855 | 2,034,543 | 589 | 106,197 | 87,177 | 3 | 5 | 9,949 | 426,491 | 29,215 | 2,354,837 | 34 | 18 |
| 35855 | Condensing units, all refrigerants | 414 | 223,675 | 7 | 6,859 | 5,631 | 2 | 3 | | | | | | |
| 35856 | Room air conditioners and dehumidifiers: | | | | | | | | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) |
| 35856 11 | Dehumidifiers | 589 | 95,767 | (NA) | (NA) | (NA) | (NA) | (NA) | | | | | | |
| 35856 30 | Room air conditioners | 2,667 | 639,198 | 77 | 28,587 | 23,467 | 3 | 4 | 259 | 57,972 | 2,849 | 668,583 | 9 | 9 |
| 3585A | Nonelectric warm air furnaces and humidifiers | (X) | 715,756 | (NA) | (NA) | (NA) | (NA) | (NA) | | | | | | |
| | Warm air furnaces | 1,961 | 683,642 | 23 | 6,832 | 5,608 | 1 | 1 | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) |
| | Humidifiers | 422 | 32,114 | (NA) | (NA) | (NA) | (NA) | (NA) | | | | | | |
| | 1984 | | | | | | | | | | | | | |
| 35851 | Heat transfer equipment, (excluding room and unitary air conditioners and dehumidifiers) | (X) | 3,544,964 | (NA) | (NA) | (NA) | (NA) | (NA) | | | | | | |
| 35852 | Unitary air conditioners | (NA) | 2,913,530 | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) |
| 35853 43 | Commercial refrigeration equipment, mechanical drinking water coolers | 528 | 123,558 | 65 | 13,590 | 11,899 | 12 | 11 | | | | | | |
| 35854 | Compressors and compressor units, all refrigerants | 22,776 | 2,225,414 | 860 | 139,400 | 122,059 | 4 | 6 | 9,473 | 398,664 | 31,389 | 2,484,678 | 30 | 16 |
| 35855 | Condensing units, all refrigerants | 440 | r248,507 | 7 | 6,161 | 5,394 | 2 | 2 | | | | | | |
| 35856 | Room air conditioners and dehumidifiers: | | | | | | | | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) |
| 35856 11 | Dehumidifiers | r586 | r96,017 | (NA) | (NA) | (NA) | (NA) | (NA) | | | | | | |
| 35856 30 | Room air conditioners | 3,039 | 846,916 | 126 | 46,074 | 40,342 | 4 | 5 | 142 | 32,183 | 3,055 | 838,757 | 5 | 4 |
| 3585A | Nonelectric warm air furnaces and humidifiers | (X) | r685,951 | (NA) | (NA) | (NA) | (NA) | (NA) | | | | | | |
| | Warm air furnaces | r1,882 | r648,830 | 24 | 6,506 | 5,697 | 1 | 1 | (NA) | (NA) | (NA) | (NA) | (NA) | (NA) |
| | Humidifiers | 428 | 37,121 | (NA) | (NA) | (NA) | (NA) | (NA) | | | | | | |

(NA) Not available. rRevised by five percent or more from previously published figures. (X) Not applicable.

[1] For comparison of SIC-based product codes with Schedule B export numbers and TSUSA import numbers, see table 10.
[2] Source: Bureau of the Census report FT-410, U.S. Exports--Schedule E--Commodity by Country.
[3] These values were derived by use of adjustment factors to exclude freight, insurance, and other charges incurred in moving goods to the port of export. This adjustment is made to convert the values to an approximation of the producers' value of exported goods. Current adjustment factors are based on data for 1981 which are published in Origin of Exports of Manufactured Products, M81(AS)-5, appendix B. The adjustment factor applicable to this report is 0.8209.
[4] Source: Bureau of the Census report IM 145-X, U.S. Imports for Consumption and General Imports.
[5] This dollar value represents the c.i.f. (cost, insurance, and freight) value at the first port of entry in the United States, plus U.S. import duties.
[6] Apparent consumption is derived by subtracting exports from the total of manufacturers' shipments plus imports.

Table 10. COMPARISON OF STANDARD INDUSTRIAL CLASSIFICATION CODES, SCHEDULE B EXPORT NUMBERS, AND TSUSA IMPORT NUMBERS

| Product code | Product description | Export number | Import number |
|---|---|---|---|
| 35851 | Heat transfer equipment, (excluding room and unitary air-conditioners and dehumidifiers) | 661.2212, 661.2318, 661.2319, 661.2322, 661.2323, 661.2325, 661.2226, 661.2327 661.3550, 661.3555, 661.3570, 661.3572 | 661.2031, 661.3560 |
| 35852 | Unitary air conditioners | 661.2242, 661.2245, 661.2250, 661.2262, 661.2265, 661.2270, 661.2380, 661.2312 661.2314, 661.2316 | 661.2037, 2100, 2200 |
| 35853 | Commercial refrigeration equipment: | | |
| 35853 43 | Mechanical drinking water coolers | 661.3560 | 661.3560 |
| 35854 | Compressors and compressor units, all refrigerants | 661.1201, 661.1204, 661.1215, 661.1218, 661.1222 | 661.0900, 661.1001, 661.1002, 661.1018, 661.1020, 661.1022, 661.1024, 661.1026 |
| 35855 | Condensing units, all refrigerants | 661.3582, 661.3584, 661.3586, 661.3587, 661.3588, | 661.3555 |
| 35856 | Room air conditioners and dehumidifiers | 661.2220, 661.2235, *661.3568 | 661.2025 |
| 3585A | Warm air furnaces and humidifiers | 653.4660 | *653.5232, 653.5234 |

*Part of this code is comparable.

## DESCRIPTION OF SURVEY

**Scope of Survey.** This survey covers firms engaged in the manufacture of refrigeration, air conditioning equipment, and nonelectric warm air furnaces.

**Survey Methodology.** The statistics in this publication were collected by mail on Bureau of the Census annual Form MA35M, Refrigeration and Air Conditioning Equipment, Including Warm Air Furnaces. The survey panel includes all known producers of these products, except very small companies (generally, those with less than 10 employees) for which data in the 1982 Census of Manufactures were derived from administrative records of other government agencies. Approximately 280 companies are included in the survey panel. No estimate is derived for the small firms excluded from the survey.

**Reliability of Data.** Survey error may result from several sources: (1) inability to obtain information about all cases in the survey; (2) response errors; (3) definitional difficulties; (4) differences in the interpretation of questions; (5) mistakes in recording or coding the data obtained; and (6) other errors of collection, response, coverage, and estimation for missing data. These nonsampling errors also occur in complete censuses. Although no direct measurement of the biases due to nonsampling errors has been obtained, precautionary steps were taken in all phases of the collection, processing, and tabulation of the data in an effort to minimize their influence.

A major source of bias in the published estimates is due to imputing data for nonrespondents, for late reporters, for small companies not included in the mail panel, and for data which fail logic edits. Missing figures are imputed based on yearly movements shown by reporting firms. Imputation generally is limited to a maximum of 15 percent for any one data cell. Figures with imputation rates greater than 15 percent are footnoted.

The imputation rate is not an explicit indicator of the potential error in published figures due to nonresponse, because the actual yearly movements for nonrespondents may or may not closely agree with the imputed movements. The range of difference between the actual and imputed figures is not precisely known, but is assumed to be small. The degree of uncertainty regarding the accuracy of the published data increases as the percentage of imputation increases. Figures with imputation rates above 15 percent should be used with caution.

**Revisions to Previous Period Data.** Statistics for previous years may be revised as the result of corrected data from respondents, late reports for which imputations were made as described above, or other corrections. Figures which have been revised by more than 5 percent from previously published figures are indicated by footnotes.

Revisions include changes to prior period data resulting from reconciliation of the results of this survey with the 1984 Annual Survey of Manufactures to correct differences in reported data between the two series and to identify and verify new establishments included in the scope of this survey. Table 8 presents a comparison of data from the two series by census product class following the reconciliation.

**Adjustment for Price Change.** All dollar figures included in this publication are in current dollars; i.e., they have not been adjusted for price change.

## EXPLANATION OF TERMS

Quantity *and Value of Shipments.* The figures on quantity and value of shipments represent physical shipments of all products sold, transferred to other establishments of the same company, or shipped on consignment, whether for domestic or export sale. The value represents the net sales price, f.o.b. plant, to the customer or branch to which the products are shipped, net of discounts, allowances, freight charges, and returns. Shipments to a company's own branches are assigned the same value as comparable sales to unaffiliated customers; i.e., the value includes an appropriate allocation of company overhead and profit. Products bought and resold without further manufacture are excluded.

*Condensing Units (Complete).* Includes units for household refrigerators and freezers.

*Open-Type Condensing Units.* A specific refrigerating combination for a given refrigerant, consisting of a compressor with an extended shaft for an external drive, a condensor, a liquid receiver (when required), and the regularly furnished accessories.

*Hermetic-Type Condensing Unit.* A specific refrigerating combination for a given refrigerant, consisting of a compressor and a motor, both of which are enclosed in the same housing, with no external shaft or shaft seal; the compressor motor operating in the refrigerant atmosphere; a condenser; a liquid receiver (when required); and the regularly furnished accessories. The compressor and compressor motor housing may be either the fully welded or brazed type, or the service-sealed type.

*Compressors and Compressor Units.* Includes units for household refrigerators and freezers.

*Hermetic-Type Motor Compressor.* Consists of a mechanical compressor and motor, both of which are enclosed in the same housing, with no external shafts or shaft seals, the motor operating in the refrigerant atmosphere, and using a refrigerant other than ammonia.

*Open-Type Compressor.* An open type compressor (with or without motor) is a specific machine for compressing a given refrigerant vapor consisting of a compressor with an extended shaft for an external drive.

*Heat Transfer Equipment*

*Evaporative Condensers.* Condensing coil, spray system and pump (if furnished), a means for air circulation (including drive if furnished), and frame and enclosure.

*Room Fan-Coil Air-Conditioning Units.* Units which are factory-made assemblies providing the functions of circulation, cooling and heating, and filtering of air, but which do not include the source of cooling or heating. These devices are normally designed for free delivery of air into a room, but may be applied with minimal duct work having a static resistance generally not exceeding ¼ inch of water. These devices may be designed for furred-in application, within the conditioned space. These devices are generally designed in sizes of less than 1500 CFM air delivery.

*Room Air-Induction Units.* Consists of a cooling coil, or cooling and heating coil, and means for delivering preconditioned air (received under pressure from an external source, mixed with recirculated air) to the space being conditioned.

*Central Station Air Conditioning Units, Motor-Driven Fan Type.* Units for use with a remote source of cooling or heating and cooling (not including units for heating only), consisting of a coil, fan, and enclosure (not including units which are (1) incorporated by the manufacturer into a unitary system or (2) of the room fan-coil type).

*Packaged Terminal Air Conditioners.* Factory selected combinations of heating and cooling components or assemblies, intended to serve an individual room, and comprising: (1) heating assembly available with elements for use with hot water, steam, and electricity; means for forced heated air circulation and distribution; integral or remote temperature controls; (2) slide-in cooling section with complete refrigerant cycle; (3) room cabinet; (4) provision for outdoor air intake and discharge and accessories as required for mounting in a building wall; (5) provisions for air filtration and ventilation; (6) permanent individual branch circuit wiring with a suitable line cord or terminating as a junction box with the room cabinet; and (7) provisional for free conditioned distribution or when forced circulation is employed for minimal duct work having a total external static resistance not exceeding 1/10 inch of water.

*Unit Coolers, Refrigeration, All Types.* Equipment in suitable enclosures with refrigerant or brine coils, fans, fan motor and drive; with or without refrigerant control; with or without sprays, pump, and defroster. This unit is also known as a forced air evaporator.

*Air-Cooled Refrigerant Condensers, Remote-Type.* Condensing coil, a means for air circulation (including drive if furnished), frame, and enclosure.

*Miscellaneous Heat Transfer Equipment*

*Shell-and-Tube, Shell-and-Coil, Shell-and-U-Tube, Tube-in-Tube Condensers*

*General.* A water-cooled refrigerant condenser is a made assembly of elements by which the flows of refrigerant vapor and water are maintained in such heat transfer relationship that the refrigerant vapor is condensed into a liquid.

*Shell-and-Tube Refrigerant Condenser.* One in which the refrigerant vapor is condensed either on the inside or on the outside of a group of straight parallel tubes within a closed shell, with the tubes terminating at each end in a tube sheet.

*Shell-and-U-Tube Refrigerant Condenser.* One in which the refrigerant vapor is condensed in a closed shell, with the cooling water circulated through a tube bundle consisting of U-tubes terminating in a single tuber sheet.

*Tube-in-Tube Refrigerant Condenser.* Consists of one or more assemblies of two tubes, one within the other, in which the refrigerant vapor is condensed either in the annular space or in the inner tube.

*Shell-and-Coil Refrigerant Condenser.* One in which the refrigerant vapor is condensed in a closed shell, with the cooling water circulated through one or more continuous or assembled coils contained within the shell.

*Shell-and-Tube, Shell-and-Coil, Shell-and-U-Tube Liquid Coolers*

*General.* A refrigerant-cooled liquid cooler is a factory-made assembly of elements in which the liquid and the refrigerant are in heat transfer relationship, causing the refrigerant to evaporate and the liquid to be cooled.

*Shell-and-Tube Liquid Cooler.* One in which the heat transfer is effected through a group of straight parallel tubes within a closed shell, and the tubes terminating at both ends of the cooler.

*Shell-and-U-Tube Liquid Cooler.* One in which the heat transfer is effected through a U-tube bundle is a closed shell; the U-tubes terminating at one end of the cooler.

*Tube-in-Tube Liquid Cooler.* Consists of one or more assembles of two tubes, one within the other, in which the heat transfer is effected through the inner tube or tubes.

*Shell-and-Coil Liquid Cooler.* One in which the heat transfer is effected through one or more continuous or assembled coils contained within a closed shell.

*Liquid-Suction Heat Exchanger.* A device used to transfer heat from the refrigerant liquid to the suction gas. Such devices may be of the following types: shell-and-coil, tube-in-tube, finned-tubed-in-tube, etc.

*Refrigerant Liquid Receiver.* A vessel, permanently connected to a refrigerant system by inlet and outlet pipes, for storage of a liquid refrigerant.

*Central System Finned Coils, Air-Conditioning and Refrigeration Type, Used With But Not Including Means for Air Circulation.* One of two row coils are considered as heating only coils. Three or more row coils are considered as cooling and/or heating coils.

*OEM Coil Sales Intended for Resale or Assembly Into Equipment by Other Manufacturers (All Types).* Includes shipments of coils to private branders and OEM accounts, as well as those finned coils that are intended for resale or for assembly into equipment by other manufacturers.

*Factory-Assembled, Refrigeration-Type, Finned Gravity Coils.* Includes all types of (1) flat or shaped plate surface-type heat exchangers for use with volatile refrigerants, eutectic solutions, or brine and (2) extended surface heat exchangers consisting of tube or pipe prime surface and finned secondary surface, generally used for refrigeration in either frosted or not frosted operation, and usually without forced circulation of the substance being refrigerated. These include bunker and gravity-type evaporators.

*Wetted-Surface Dehumidifiers.* Consists of a suitable enclosure containing cooling coils or means for liquid spray over the cooling coils and tank but without means for air circulation provided as an integral part of the unit. The unit may include a recirculating water pump, eliminator plates, and inlet deflectors.

*Packaged Unitary Air-Conditioning Equipment, Except Room Air Conditioners*

*Year-Round Air Conditioners, Except Heat Pumps and Pumps and Packaged Terminal Air Conditioners*

*Single-Package.* Includes factory-made assemblies of one or more condensing units or absorption refrigeration units, a heat-generating unit (such as electric, gas, or oil-fired furnace), and means for air-cooling, dehumidifying, and control of temperature. Excludes equipment having separate cooling and heating units connected only by duct work as well as heat pumps or air conditioners designed for free-air delivery, such as room air conditioners and packaged terminal air conditioners. Year-round rooftop units are included in this category. Cooling only rooftop units are reported under the single package air conditioner category.

*Remote-Condenser Type.* Includes all units which have the condenser located remotely from the equipment described above.

*Heat Pumps, Except Room Air Conditioners*

*Single Package.* Includes factory-made assemblies of one or more condensing units or evaporators and means for air-circulation, ventilation, and cleaning with provision for modifying the performance so that either heating or cooling and dehumidification may be produced. Includes all heat pumps, whether water-to-air, water-to-water, or air-to-air.

*Split Systems.* Includes all of those units which have the coil located remotely from the equipment described above.

*Split System Air Conditioning Units*

*Air Conditioning Condensing Units.* These are assembled in factory-made enclosures and consist of a motor-driven compressor, a condenser, and may include a liquid receiver.

*Other Air Conditioning and Refrigeration Equipment*

*Centrifugal Liquid-Chilling Packages, Hermetic- and Open-Types.* These are factory-made assemblies of one or more centrifugal compressors, condensers, liquid coolers, controls, component parts, with or without drive or prime mover, as furnished by the manufacturer. The hermetic centrifugal horsepower should be the maximum brake horsepower for which the motor is rated. The open centrifugal horsepower should be the maximum brake horsepower for which the motor or turbine drive, to which the machine is intended to be connected, is rated.

*Absorption Liquid-Chilling Systems.* Those systems of 25 tons and over which cool and dehumidify the air by means of cold contact surface in the same manner as compression system. (This is the closed-type absorption system.)

*Absorption and Open-Type Absorption System*

*Absorption System.* A system utilizing the process by which gas is taken up by the capillaries and extended surface of porous material.

*Open-Type Absorption System.* A system which dehumidifies by bringing the air into direct contact with the absorbent.

*Mobile Vehicle Refrigeration and Air Conditioning Systems.* An assembly of refrigeration compressor apparatus with suitable power source for use when the vehicle is in motion or not in motion; means for air-cooling and dehumidification; means for air circulation, ventilation, and air-cleaning; interconnecting refrigerant piping; and refrigerant and temperature control apparatus, for mounting on the vehicle. The system may or may not have provision for heating.

*Reciprocating Liquid-Chilling Packages.* Factory-made assemblies of one or more reciprocating compressors, condensers, and water or brine coolers, with interconnections, base, and accessories, and may be furnished with or without refrigerant, drive, and prime mover.

*Electrically Operated Dehumidifiers, Mechanically Refrigerated, Self-Contained.* A dehumidifier of this type is a factory-made

assembly of a condensing unit and means for air-circulation, dehumidification, and condensate collection.

*Factory Fabricated Water-Cooling Towers for Assembly at the Factory or on the Job Site.* Those towers which are prefabricated by the manufacturers and shipped either as a factory-assembled section (i.e., cell) or as major components (e.g., casing, fan, precut fill) for assembly at the site of the installation.

*Nonelectric Warm Air Furnace.* A device for the transfer of heat, generated by the combustion of fuel within the device, or by radiation from an electric heating element, to air that flows between the combustion chamber and an outer enclosure to pipes or ducts that carry the heat to the desired location. In a gravity air flow furnace, the warm air rises by gravity. In a forced air furnace the warm air is circulated by a motor-driven blower.

## COMPARISON OF EXPORT, IMPORT, AND DOMESTIC OUTPUT DATA

The Standard Industrial Classification (SIC) system used for domestic output and the statistical export and import commodity classifications were developed independently. This results in considerable difficulty in comparing the three types of data for many commodity areas. The domestic output classification is based on type of industry; on the other hand, the export and import classification system is more materials oriented. Also, there are a substantial number of imported commodities which have no comparable domestic output classification. The relationships shown in this report should be considered only as approximations, since, in addition to the problems mentioned above, there are also the following problems affecting the comparability of the three sets of data.

**Valuation.** There are different methods of valuation for the three types of data:

- *Domestic Output*— Valued at the point of production. It includes the net sales price, f.o.b. plant, after discounts and allowances, exclusive of freight charges and excise taxes.

- *Exports*— Valued at the point of exportation. It includes the selling price, or cost if not sold, and inland freight, insurance and other charges to the export point.

  Estimated producers' values of exports have also been developed. These values more closely approximate the values reported for domestic output because they exclude freight, insurance, and other charges applied from the producing plant to the export point.

- *Imports*— Valued at the first port of entry in the United States. It includes c.i.f. (cost, insurance, and freight), duty, and other charges to the import point.

**Duplication in Quantity and Value of Output.** Because producers' shipments of some commodities may be used as materials for incorporation into other commodities, combinations of data for such commodities may contain a certain amount of duplication. Thus, percentages of exports to output or imports to apparent consumption (output plus imports minus exports) at four-digit or broader levels may be understated. Where duplication is known to be substantial, the output data are appropriately noted in the table.

**Low-Value Import and Export Transactions.** Detailed commodity information is not included for individual export shipments valued at not more than $1,000. Generally, detailed commodity information is not included for individual import shipments valued at not more than $1,000. For textiles and textile products, gloves, footwear, and miscellaneous rubber and plastics products, detailed commodity information is not included for individual import shipments valued at not more than $250. This is believed to have only negligible effects on the statistics for the bulk of the commodities.

**Manufacturers' Shipments, Not Specified by Kind.** The value of manufacturers' shipments at the four-digit industry level often includes a small amount which is not distributed among the individual five-digit product classes. Export and import percentages at the more detailed levels might, therefore, be slightly overstated.

**Time Lag Between Output and Exports.** There will be a lag between the time a commodity is produced or shipped by the producer and the time it is actually exported, especially when intermediaries (wholesalers, exporters, etc.) are involved. Ordinarily, this type of discrepancy is insignificant in annual figures.

**"Direct" vs "Total" Commodity Exports and Imports.** Export and import data do not include materials which are incorporated into other more finished products and exported or imported in finished form. Thus, by showing only direct exports and imports, the relation of exports to output and imports to apparent consumption for intermediate products is considerably understated.

**Used Commodities.** With a few exceptions, used or rebuilt commodities are classified in the same import or export codes as is new merchandise. Percentages are thus overstated to the extent that used or rebuilt products are significant in trade.

**Geographic Area of Coverage.** Import and export data reflect the movement of merchandise into and out of U.S. foreign trade zones, the U.S. Virgin Islands, and the U.S. customs territory (includes the 50 States, the District of Columbia, and Puerto Rico).

## HISTORICAL NOTE

Data on air conditioning and refrigeration have been collected by the Bureau of the Census since 1944. Historical data may be obtained from Current Industrial Reports (called Facts for Industry before 1959) available at your local Federal Depository Library. A list of these libraries may be obtained from the Bureau of the Census regional offices:

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## RELATED REPORTS

The Bureau of the Census publishes the following related reports:

| Series | Frequency | Title |
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| *Current Industrial Reports* | | |
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| MA36F | Annually | *Major Household Appliances* |
| *Other Industry Reports* | | |
| M3-1 | Monthly | *Manufacturers' Shipments, Inventories, and Orders* |
| (AS) | Annually | Annual Survey of Manufactures (ASM) |
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## CONTACTS FOR DATA USERS

| Subject Area | Contact | Phone Number |
|---|---|---|
| Current Industrial Report MA35M | Pamela J. Glekas | (301) 763-2529 |
| Classification Systems Comparability | James Kristoff (ESD) | (301) 763-1935 |
| Foreign Trade publications | Joyce Ware | (301) 763-5140 |
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| To order a Census Bureau publication | Customer Services (DUSD) | (301) 763-4100 |
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